MISCHMETAL OXIDE TBC

ABSTRACT

The present invention is a turbine engine component comprising a superalloy substrate, a bond coat overlying the substrate having a thickness in the range of about 0.0005 inch to about 0.005 inch, a thin alumina scale overlying the bond coat, and a thermal barrier coating (TBC) overlying the thin alumina scale, the TBC having a thickness in the range of about 0.0025 inch to about 0.010 inch, and comprising at least mischmetal oxide. The present invention is also a method for the application of a thermal barrier coating to a superalloy turbine engine component comprising the steps of: providing an electron beam physical vapor deposition apparatus, providing a turbine engine component comprising a surface to be coated, providing an oxide ingot comprising mischmetal oxide and another oxide material selected from the group consisting of yttria-stablized zirconia, zirconia, yttria, hafnia, at least one other rare earth oxide, and combinations thereof, placing the component and the ingot into the apparatus, drawing a vacuum within the apparatus, forming a melt pool on the ingot, dispersing mischmetal oxide vapors and yttria-stabilized zirconia vapors, depositing the mischmetal oxide vapors and the yttria-stabilized zirconia vapors onto the surface to be coated, said deposition forming a thermal barrier coating having a thickness in the range of about 0.0025 inch to about 0.010 inch.